

## ABSTRACT

The Centre for Best Available Techniques (BAT) is founded by the Flemish Government, and is hosted by VITO. The BAT centre collects, evaluates and distributes information on environmentally friendly techniques. For the sector that deals with the distribution of LNG, which is the object of the present BAT study, special attention is also paid to securing the external safety. The Centre for Best Available Techniques (BAT) advises the Flemish authorities on how to translate the BAT-conclusions into its environmental policy. Central in this translation is the concept "BAT" (Best Available Techniques). BAT corresponds to the techniques with the best environmental and external safety performance that can be introduced at a reasonable cost. In this report, BAT are selected for specific industrial activities where LNG is distributed to vehicles and vessels.

The BAT selection (chapter 5) and the set of related policy recommendations (chapter 6) in this study are based on plant visits, a literature survey, a technical and socio-economic study (chapter 2), a comparison with standards and foreign (BAT) documents, company visits, and consultations with representatives of relevant federations, suppliers, specialists from the administration and consultancies. The formal consultation took place during various meetings with the members of the steering committee, representing the sector or government. In parallel, this study was reviewed by a panel of external lecturers with a diverse background in terms of expertise.

Although the title of this study refers to "distribution" and "LNG" in general terms, a demarcation of the scope is done in consultation with the aforementioned steering committee. First of all, "distribution" is a collective term for activities related to the distribution of LNG. "LNG" is a collective term for methane-containing liquid gases, of fossil, synthetic or biogenic origin. The installations considered in this study do not exceed the threshold values for high-threshold devices (200 tonnes).

The main potential impact of such distribution activities on the environment and environment is safety-related. The prevention of an (uncontrolled) release is the central goal around which a number of preventive and curative measures have been formulated in this study. In addition, but to a lesser extent, energy efficiency and noise are relevant environmental aspects when the distributing LNG.

In chapter 4 of this study, 37 techniques are described which are considered to be candidate best available techniques, after which, in consultation with the steering committee, and after evaluation of these techniques in chapter 5, a set of 29 best available techniques came into being. The level of detail of description of the techniques measure is not always the same. Some measures are rather formulated to tackle a general goal (e.g. "preventing of LNG storage tank fill rate exceedance") and can be dealt with in different ways with more concrete techniques, which in turn have been evaluated. Other techniques are immediately described in more detail (e.g. having installed properly working deadman buttons).

Because of the relevance of the external safety component for the distribution of LNG, an external safety expert was appointed for this study to perform risk assessments in order define extra measures such as distance rules. To this end, the expert has also developed two self-evaluation tools which operators will be able to use to calculate the safety distances (among others) of their LNG-installation. The tool is excel-based, and will be made available to the general public..

This study describes the current state of affairs in the rapidly evolving context of infrastructure and technological developments, technological development, formulation of guidelines, and the expansion of application possibilities for LNG and related substances.

It is therefore appropriate to read this document in this time perspective and to keep an eye on the most recent evolutions in relation to the aforementioned themes. Finally, a chapter (7) was included in this study, focusing on certain 'emerging techniques'. Some of the aforementioned technological developments are described in this last chapter 7.